

REMARKS

Entry of this Amendment is proper under 37 C.F.R. § 1.116, because the Amendment places the application in condition for allowance for the reasons discussed herein; does not raise any new issue requiring further search and/or consideration, because the amendments amplify issues previously discussed throughout prosecution; does not present any additional claims; and places the application in better form for an appeal should an appeal be necessary. The Amendment is necessary and was not earlier presented, because it is made in response to arguments raised in the final rejection. Entry of the Amendment, reexamination and further and favorable reconsideration of the subject application in light of the following remarks, pursuant to and consistent with 37 C.F.R. § 1.116, are thus respectfully requested.

Favorable reconsideration is respectfully requested in light of the following remarks, wherein Claims 1 and 7 are amended; and no claim is canceled or added. Claims 1-14 remain pending in the present application.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: the original claims and the specification, page 2, paragraph 7.

Summary of Examiner Interview

As an initial matter, Applicants express gratitude to Examiner Kong for the courtesies granted Applicants' representative during the recent telephone interview. During the interview, some proposed amendments were discussed. Further, differences between the claimed invention

and the cited prior art were discussed. However, no agreement was reached with respect to the claims.

35 U.S.C. § 103 Rejections

Claims 1, 2, 4-14 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 6,616,244 to Hakkinen (hereafter “*Hakkinen*”) in view of U.S. Patent No. 6,859,729 to Breakfield et al. (hereafter “*Breakfield*”) and U.S. Patent No. 6,839,560 to Bahl et al. (hereafter “*Bahl*”). Also, Claim 3 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over *Hakkinen* in view of *Breakfield*, *Bahl*, and further in view of U.S. Patent No. 6,480,769 to Kageyama (hereafter “*Kageyama*”).

The Examiner alleges that *Hakkinen* discloses a mine control system for monitoring and determining the location of a mining vehicle in a mine having multiple sections. Further, the Examiner alleges that *Hakkinen* discloses mining vehicles with measuring devices to determine location and that wireless communication is used to transmit that location information to the control room. Further, *Hakkinen* allegedly discloses arranging markers in the mine for location determination.

The Examiner admits that *Hakkinen* fails to disclose coverage area of base stations; arranging at least one base station in the second mine section for establishing data communication between mining vehicle and the wireless network in the first mine section; or determining location of the mining vehicle in the first mining section by means of positioning performed in the wireless network based on the location of at least one base station in the first mining section. However, the Examiner alleges that it would have been obvious to modify

Hakkinen to arrange base stations (markers) for establishing wireless data communication between the mining vehicle and network as allegedly taught by *Breakfield* and to arrange signal transmitting base stations in desired location within the mine as allegedly taught by *Bahl*.

Applicants respectfully traverse these rejections. A finding of obviousness under 35 U.S.C. § 103 requires a determination of the scope and content of the prior art, the differences between the invention and the prior art, the level of ordinary skill in the art, and whether the differences are such that the claimed subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made. *Graham v. John Deere Co.*, 383 U.S. 1 (1966). The Office's objective analysis of obviousness should be made explicit. *See KSR Int'l Co. v. Teleflex, Inc.*, 82 U.S.P.Q.2d 1385, 1396 (2007).

Differences between the invention and the prior art

Claims 1 and 7 each recite at least one first mine section and at least one second mine section. The location of the mining vehicle in the first mine section is determined by means of positioning on the basis of the location of the signal transmitting from at least one base station, while the location in the second mine section is determined "by only the at least one measuring device provided in the mining vehicle." None of the cited prior art discloses at least this combination of elements.

Hakkinen fails to disclose determining the location of mining vehicles based on the location of the signal transmitting from at least one base station. *Hakkinen* merely discloses determining the location of the production mining vehicles by use of a marker system established by a measuring vehicle, wherein the marker system is continuous throughout each of the mine

sections in which that vehicle travels. *See, e.g.*, col. 5, ll. 13-34. The location of the measuring vehicle is determined by use of measuring devices and video cameras. *See, e.g.*, col. 4, ll. 28-40. *Hakkinen* fails to disclose a single vehicle used in the mine that utilizes both measuring devices and base stations to determine locations within the mine as recited in claims 1 and 7.

Breakfield also fails to disclose determining the location of mining vehicles based on the location of the signal transmitting from at least one base station. *Breakfield* merely discloses determining the location of surface traveling mine detecting vehicles using GPS, not vehicles underground in a mining system. *See, e.g.*, col. 1, ll. 11-18. *Breakfield* further discloses a number of alternative back up systems for determining locations of the vehicles upon dropout of the GPS. *See, e.g.*, col. 2, ll. 55-61. *Breakfield* fails to disclose any mining sections. Further, *Breakfield* fails to disclose certain sections of the disclosed minefield containing a wireless data communication network where location is determined based on signals transmitted from base stations and other sections where a measuring device on the vehicle is used because that section does not have enough base stations to determine the location of the mining vehicle using signal transmission.

Bahl fails to disclose determining the location of mining vehicles using a measuring device on the vehicle. *Bahl* merely discloses determining the location of a mobile computing device within in a building by use of a wireless network on the basis of signals transmitting from base stations. *See, e.g.*, col. 2, ll. 1-22. *Bahl* fails to disclose any mining sections. Further, *Bahl* fails to disclose certain sections of the disclosed building where location is not determined using the wireless network and instead is determined only by at least one measuring device provided in the mining vehicle.

Therefore, none of the cited references disclose at least the combination of having multiple mine sections in which location of the mining vehicle is determined based on the signal strength from base stations in a first mine section and determined based only on at least one measuring device provided in the mining vehicle in a second mine section.

Whether the differences are such that the claimed subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made

It is impermissible to first ascertain factually what the inventor did and then view the prior art in such a manner as to select only those which may be modified from the many random facts taught by the references to reconstruct the invention from such prior art. *In re Shuman*, 227 U.S.P.Q. 54, 57 (CCPA 1966). *Panduit Corp. v. Dennison Mfg. Co.*, 227 U.S.P.Q. 337, 343 (Fed. Cir. 1985).

Using the claimed invention as a roadmap to find its prior art components is impermissible hindsight reasoning. *Princeton Biochemicals Inc. v. Beckman Coulter Inc.*, 75 U.S.P.Q.2d 1051, 1054 (Fed. Cir. 2005). Additionally, independently selecting and choosing elements of the claims is impermissible in assessing obviousness, because 35 U.S.C. § 103 requires assessment of the invention as a whole. *Ruiz v. A.B. Chance Co.*, 69 U.S.P.Q.2d 1686, 1690 (Fed. Cir. 2004). The “as a whole” assessment of the invention requires a showing that one of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements in the prior art, and combined them in the claimed manner. *See, e.g. Princeton Biochemicals Inc. v. Beckman Coulter Inc.*, 75 U.S.P.Q.2d 1051, 1054 (Fed. Cir. 2005). The Office fails to provide any rationale for why one of ordinary skill in the art without using the

claims as a roadmap, would have selected a location determining system in which first mine sections contain a wireless network of signal transmitting base stations to determine location of the mining vehicles and second mine sections where location is determined solely by at least one measuring device in the mining vehicle because not enough base stations are present to determine the location of the mining vehicle.

One of ordinary skill in the art, without the knowledge of the claimed invention, would not have selected the method or system as recited in the claims for at least the following reasons:

- 1) the Office fails to articulate a reason for substituting the signal transmitting base stations of *Bahl* for the markers in *Hakkinen*; and
- 2) the Office fails to articulate a reason for modifying *Hakkinen and Bahl*, which each teach continuous systems, to form a discontinuous system as claimed.

1. No articulated reason for base station substitution

Hakkinen specifically discloses a locating system in which markers are painted throughout the mine so that production mining vehicles can determine its location by reading the markers. In addition, *Hakkinen* uses the marker system to avoid building fixed infrastructure into the mine. *See, e.g.*, col. 2, ll. 40-42. Avoiding fixed infrastructure lowers investment cost in the mine. Additionally, the mining is faster, at least because in a marker system when a new mine section is opened up, the measuring vehicle can quickly mark the new mine section. In contrast, when a signal transmitting system according to *Bahl* is utilized the new base stations would have to be installed and signal strengths determined before the production mining vehicles could enter, which would likely include slower manned operations. In contrast to all the reasons presented in *Hakkinen* for why it would not have been obvious to substitute signal transmitting base stations for markers, the Examiner has provided no reason why the substitution would have been obvious. Further, the Examiner has provided no evidence to show that the system of *Bahl*

would have been expected to work or lead to predictable results in a mining environment, where different mine sections are separated by large portions of earth as opposed to different rooms in a building.

2. No articulated reason for discontinuous system

Even if, *arguendo*, it would have been obvious to modify *Hakkinen* with signal transmitting base stations disclosed in *Bahl*, the systems in both *Hakkinen* and *Bahl* are continuous systems in which the markers or base stations are distributed throughout the system for use in determining locations of objects. Neither reference discloses the claimed system of having different location determining systems in different sections of the mine.

The Examiner appears to rely on *Breakfield* for a system where different locating systems are used when there is a dropout of GPS. However, needing a backup system for GPS dropouts is quite different from setting up a system in which some sections of a mine have a wireless network and other sections of the mine do not so that measuring devices on the vehicle are required to determine location in those second sections. The Examiner has provided no evidence showing that the continuous systems of *Hakkinen* and *Bahl* would have been modified to an intentional discontinuous system and that such a modification would have had predictable results. In contrast, the cited references provide evidence that such a modification would not have been contemplated or predictable by one of ordinary skill in the art.

First, *Breakfield* teaches backup systems that are available for location determination in any portion of the minefield, because there is no way to determine exactly where the GPS will dropout every time. *Bahl* also recognizes the difficulty of relying on GPS for location determinations, and instead of providing backup systems, *Bahl* discloses a wireless network to

replace the GPS systems for location determinations. The wireless network is provided throughout the indoor environment to ensure that the object to be located can be located at any location within the building. Similarly, *Hakkinen* specifically designs his marker system to ensure that expensive measuring devices are not required on the production mining vehicles using the marker system for location determinations. Therefore, the cited references disclose that back up systems may be necessary when using an imperfect locating system such as GPS, but when utilizing a network of markers or base stations that are purposely installed for location determination, the network is continuous and back up systems are to be avoided to lower system costs.

For at least the foregoing reasons, the method and system of independent Claims 1 and 7, and the claims depending therefrom, are patentably distinguishable over the applied documents. Accordingly, withdrawal of the rejections of record and allowance of this application are earnestly solicited.

Conclusion

Should any questions arise in connection with this application, or should the Examiner believe a telephone conference would be helpful in resolving any remaining issues pertaining to this application, it is respectfully requested that the undersigned be contacted at the number indicated below.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account 50-0573. This paragraph is intended to be a CONSTRUCTIVE PETITION FOR EXTENSION OF TIME in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully Submitted,

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